Rikaline **GPS-6030**

SiRF High sensitivity

Bluetooth GPS
Receiver

User's Guide

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Rikaline **International Corp.**

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English Version

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0. Quick Use & Basic Specification

After you have received your Rikaline GPS-6030 Bluetooth GPS Receiver, please do the following steps before using the device.

0.1 Install the Battery in GPS-6030 and Fully charge for at least 7 hours before using.

Low Power The right LED (LED 1) indicator turns RED (normally BLUE) when battery power becomes low. Connect the receiver to a power source for continuous operation and recharge the battery at the same time.

Charging The left LED (LED 2) indicator turns RED (or ORANGE) when the battery is being charged. RED indicator switches off automatically when fully charged.

0.2 Power on GPS-6030

Press the power button on the topside for 0.5 seconds to turn on the receiver. The left LED (LED 2) indicator will flash briefly, and the right LED (LED 1) indicator will start flashing.

0.3 Activate the Bluetooth function in your PDA or PC

Before activating Bluetooth function, please check your device is equipped with Bluetooth function. If not, you may need to acquire an optional CF (PD-3005) or SD Bluetooth Card. Activate the Bluetooth card.

0.4 BT GPS Communication to PDA or PC

Waiting to connect The right LED (LED 1) indicator will flash if there is no communication between the receiver and your device.

Connected The right LED (LED 1) indicator will turn to continuous lighting when the receiver is connected through the wireless link with your device.

0.5 Turn off your GPS-6030

To turn off the receiver, press the power button on the topside for 3 seconds. The LED indicator will flash briefly before switching off the receiver.

0.6 Appendix

0.6.1 Operation Time:

7 hours at continuous mode, longer time at power saving mode.

0.6.2 LED Indicator: GPS-6030 has two LED indicators.

The Bluetooth GPS has two LED lights which each has two colors. One is GPS & Charge status LED and the other is Bluetooth & low power status LED. The Status table of LED shows as follows:

Status	BT (Blue)	Low Power (Red)	GPS (Green)	Charge (Red)
Low Power		O		O
Charged				X
Battery Full		X		
No BT Connected			X	
Navigation Valid			O(glitter)	
Navigation Invalid			O	
BT RF Active	O			

<P.S.> O: LED active; X: LED inactive

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1. Introduction

1.1 Overview

The ***Rikaline*** **GPS-6030** Wireless GPS receiver is a Global Positioning System Receiver with Bluetooth wireless technology. This wireless GPS receiver allows you to receive GPS data on mobile handheld wirelessly. By sending GPS position data over Bluetooth, you can position the receiver for the best possible reception all without wires. The advent of wireless GPS receiver will become the next level of GPS receivers.

The ***Rikaline*** **GPS-6030** Wireless GPS receiver integrates Bluetooth module into GPS device. It shows the high performance, low power consumption, easily portable, rechargeable & removable battery function and wireless data transmission. If you have a Pocket PC or other portable devices enabled with Bluetooth function, for example iPAQ 3870/3970 and SONY Ericsson T68 mobile phone, you can take advantage of your device's Bluetooth capability to wirelessly add GPS positioning technology. When you choose suitable navigation software, you can apply to personal, vehicle tracking, and marine navigation.

If you use this wireless GPS receiver, you will ignore the messy cords and antenna and add the portability of your Pocket PC. In addition, This wireless GPS receiver can change the exhausted battery to full battery like battery of mobile phone.

1.2 Features

The GPS-6030 provides a host of features that make it easy for integration and use.

1. 12 Channels "All-In-View" Tracking
2. Position accuracy of 10 meters 2D RMS
3. Cold/Warm/Hot Start Time: 45/38/8 Seconds
4. Reacquisition Time: 0.1 seconds
5. RF connector for external GPS antenna
6. Support Standard NMEA-0183
7. Support Trickle Power mode Power Saving
8. Compatible with Bluetooth devices with Serial Port Profile (SPP)
9. Superior Sensitivity for Urban Canyon and Foliage Environment
10. Small, sleek, and lightweight design easily fit in your hand
11. Two LEDs indicating Bluetooth and GPS activity
12. Lithium-ion battery lasting full working day typical use
13. On/off push button
14. Dimension: 1.77" x 3.27" x 0.71" (45mm x 83mm x 18mm)

1.3 Technology specifications

1.3.1 Physical Dimension

Single construction integrated antenna/receiver.

Size: 83(W) x 45(D) x 18(H) (mm)
3.27"(W) x 1.77"(D) x 0.71"(H).

Weight	1.82 oz / 52g (without chargeable battery) 2.73 oz / 78g (with chargeable battery)
Antenna connector	MC plug -Note: The internal antenna will be disables when an external antenna is connected.
Power connector	ψ2.1*5.5*9.5 (The connector look the same as the DC jack of iPAQ 36/38 series PDA.)

Weight: 87g

1.3.2 Environmental Characteristics

1) Operating temperature: -20ºC to +60ºC with external power (internal temperature).
-20°C to +60°C with internal rechargeable battery.
2) Storage temperature: -20ºC to +50ºC

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1.3.3 Electrical Characteristics

1.3.3.1 General

Chipset	SiRF Star II/LP
Frequency	L1, 1575.42 MHz
C/A code	1.023 MHz chip rate
Channels	12 channel all-in-view tracking
Antenna Type	Built-in Ceramic patch antenna (External antenna optional)

1.3.3.2 Accuracy

Position	10 meters, 2D RMS
Velocity	0.1 meters/second

1.3.3.3 Datum

Default	WGS-84

1.3.3.4 Acquisition Rate (Open sky, stationary requirement)

Reacquisition	0.1 sec., average
Snap start	2 sec., average
Hot start	8 sec., average
Warm start	38 sec., average
Cold start	45 sec., average

1.3.3.5 Dynamic Conditions

Altitude	18,000 meters (60,000 feet) max.
Velocity	515 meters/second (1000 knots) max.
Acceleration	4g, max.
Jerk	20 meters/second^3, max.

1.3.3.6 Power

Operational Power	3.3VDC±10% (from internal Lithium-Ion battery pack)
Input Power	5VDC±10%
Battery Source	Rechargeable and removable 900mAh Lithium-Ion battery with 5V DC input charging circuit.
Battery Charging	Full charge 7 hours
Backup Power	3.3V (internal on board rechargeable backup battery)

Operational Current & Power Consumption

Measure of Power Consumption		
Status	Current (mA)	Power Consumption(mW)
Power On	75	300
GPS connect BT	70	280
GPS-6030 Fix without connecting BT Device.	20	80
GPS-6030 Fix with connecting BT Device	100	400

1.3.3.7 Main Interface

Connection:	Communication via Bluetooth Serial Port Profile(SPP)
Protocol messages	NMEA-0183 Version 2.20 output protocol

Default output format: GGA(1sec), GSA(5sec), GSV(5sec), RMC(1sec),VTG(1sec)

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2. Operational characteristics

2.1 Initialization

Once you insert the battery into the housing, the GPS-6030 is in standby mode and ready to work for you. When you activate the Bluetooth function in your machine (PDA or PC) and get pairing with GPS-6030, you may start GPS function. As soon as the initial self-test is complete, the GPS-6030 begins the process of satellite acquisition and tracking automatically. Under normal circumstances, it takes approximately 90 seconds to achieve a position fix at the first time, 45 seconds if ephemeris data is known. After a position fix has been calculated, information about valid position, velocity and time is transmitted over the output channel.

The GPS-6030 utilizes initial data, such as last stored position, date, time and satellite orbital data, to achieve maximum acquisition performance. If significant inaccuracy exists in the initial data, or the orbital data is obsolete, it may take more time to achieve a navigation solution. The GPS-6030 Auto-locate feature is capable of automatically determining a navigation solution without intervention from the host system. However, acquisition performance can be improved when the host system initializes the GPS-6030 in the following situation:

1) Moving further than 1,500 kilometers.
2) Failure of data storage due to the inactive internal memory battery.

2.2 Navigation

After the acquisition process is complete, the GPS-6030 sends valid navigation information over output channels. These data include:

1) Latitude/longitude/altitude
2) Velocity
3) Date/time
4) Error estimates
5) Satellite and receiver status

The GPS-6030 sets the default of auto-searching for real-time differential corrections in RTCM SC-104 standard format, with the message types 1, 5, or 9. It accomplishes the satellite data to generate a differential (DGPS) solution. The host system, at its option, may also command the GPS-6030 to output a position whenever a differential solution is available.

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3. Hardware interface

3.1 Hardware Description

The Bluetooth GPS has two LED light which each has two colors. One is GPS & Charge status LED, that is named LED 2, and the other is Bluetooth & low power status LED, that is named LED 1. The status table of LED shows as follows:

<State Table of LED>

LED1

BT & Low Power LED	**Description**	
LED1 Color and Action	**Bluetooth Active**	**Low Power**
Blue Flash	Yes	No
Purple–Red Flash	Yes	Yes

LED2

GPS & Charge LED	**Description**	
LED2 Color and Action	**Battery Charged**	**Position Fixed**
Dark	No	No
Green Flash	No	Yes
Red	Yes	No
Orange-Red Flash	Yes	Yes

<Note1>When the Bluetooth is active and LED 1 lights, it shows Bluetooth RF function. As long as the Bluetooth RF is transmitting the LED light will flash. When Bluetooth doesn't connect the other Bluetooth device, the LED 1 will be flash periodically. Therefore, it means that it broadcasts message to connect the other device with Bluetooth function. If it connects the other Bluetooth device and transmits data, LED 1 will flash very quickly and look like bright.

<Note 2>When the battery is charging, LED 1 will show purple-red color and flash. The reason that Bluetooth is working cause LED 1 purple-red color. If the GPS receiver go to the end of charge, LED 1 will show blue color and flash.

3.2 Turn on/off

Turn on To turn on the receiver, press the power button on the topside briefly (0.5 seconds). The left LED(LED 2) indicator will flash briefly. The right LED (LED 1) indicator will start flashing.

Turn off To turn off the receiver, press the power button on the topside for 3 seconds. The LED indicator will flash briefly before switching off the receiver.

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3.3 Charging

Low Power The right LED(LED 1) indicator will turn RED (normally BLUE) when battery power becomes low. Connect the receiver to a powers source to continue operation and to recharge the battery.

Charging The left LED(LED 2) indicator will turn RED (or ORANGE) when the battery is being charged. When fully charged, the RED indicator will switch off.

3.4 Bluetooth Communication

Waiting to connect The right LED(LED 1) indicator will flash if there is no communication between the receiver and another device.

Connected The right LED(LED 1) indicator will turn to continuous lighting when the receiver is connected through the wireless link with another device.

3.5 GPS

Navigating The left LED(LED 2) will flash GREEN (or ORANGE when charging) if the receiver is able to determine the current position.

3.6 PIN CODE

The **PIN** code means Personal Identification Number for Bluetooth device and it is also called as **Pass Key**. The Bluetooth GPS receiver has the default PIN Code, and is "**0000**". Generally speaking, there are two steps in Bluetooth connecting. One is pairing process, the other is link process. If you need PIN code to pairing and connect, you can use the default pin code, "**0000**" to connect Bluetooth device. Our GPS receiver belongs to non-safety connecting, you can use in general application to finish connecting.

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4. Notices

4.1 Global Positioning System

The Global Positioning System (GPS) is operated and maintained by the Government of the United States of America who are responsible for the availability and the accuracy of the system. Changes in the operation, availability and accuracy may affect the operation of your GPS receiver.

4.2 Aircraft and Hospitals

Use of devices with an antenna is prohibited on most aircraft and in many hospitals. The TomTom Wireless GPS receiver is a receiving and transmitting device with two antenna's and should not be used in these environments.

4.3 Heat Reflective Shields

Modern vehicles may have a heat reflective shield in the windshield, preventing proper GPS signal reception if the receiver is placed under the windshield. To get proper reception:
(a) Use an external antenna, or
(b) Place the receiver in a different position, or
(c) Attach the cradle to the windshield behind the rearview mirror, where many vehicles have an opening in the heat reflective shield, indicated by a black outline.

4.4 Important

The information in this document is subject to change without notice. No liability shall be assumed for technical or editorial errors or omissions contained herein; nor for incidental or consequential damages resulting from the performance or use of this material. This document contains information protected by copyright.

4.5 Battery

This product uses a Lithium-Ion battery. Please charge fully before first use. Operation in low (below 0⁰C/32⁰F or high (over 40⁰C/110⁰F) temperatures will affect power supply efficiency and the ability to charge the battery. All Lithium-Ion batteries will experience power supply efficiency deterioration over time even if not used and have a limited life expectancy. Permanently powering the battery will reduce life expectancy. Do not use your product in a humid, wet and/or corrosive environment. Do not put, store or leave your product in or near a heat source or in a high temperature location and do not expose it to temperature over 60⁰C(140⁰F). Failure to follow these guidelines may cause the Lithium-Ion battery to become hot, explode or ignite and cause injury and/or damage. **THE LITHIUM-ION BATTERY CONTAINED IN THE PRODUCT MUST BE RECYCLED OR DISPOSED OF PROPERLY. USE ONLY WITH SUPPLIED CHARGER(s) AND SUPPLIED AC ADAPTOR FOR BATTERY CHARGING.**

4.6 FCC

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
--Reorient or relocate the receiving antenna.
--Increase the separation between the equipment and receiver.
--Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
--Consult the dealer or an experienced radio/TV technician for help.

CAUTION

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

FCC RF Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.

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5. Warranty

The GPS-6030 is warranted to be free from defects in material and functions for one year from the date of purchase. Any failure of this product within this period under normal conditions will be replaced at no charge to the customers.

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Appendix A Software Interface

iPAQ Bluetooth Setup with Pocket PC software

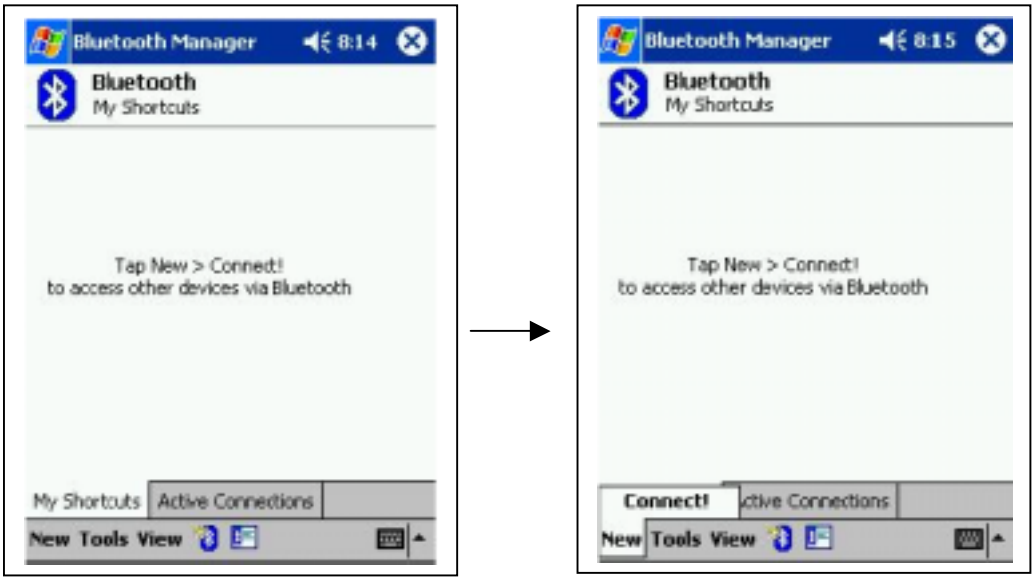
<Note1> These steps apply to the PDA with Bluetooth function, for example iPAQ PDA.

<Note2> The operation system of iPAQ Pocket PC is Window CE version and shows as follow

<Illustration> Bluetooth GPS receiver and iPAQ device

To configure the virtual serial port which the application software use with.

Firstly, you should find the device with which you want to establish connection.
Open “Bluetooth Manager” on your pocket pc.
Press “New”
Press “Connect”



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Search Bluetooth device “Rikaline 6030”
Select “Explore a Bluetooth device”
Press “Next”

Found the Bluetooth device
Double click “Rikaline”

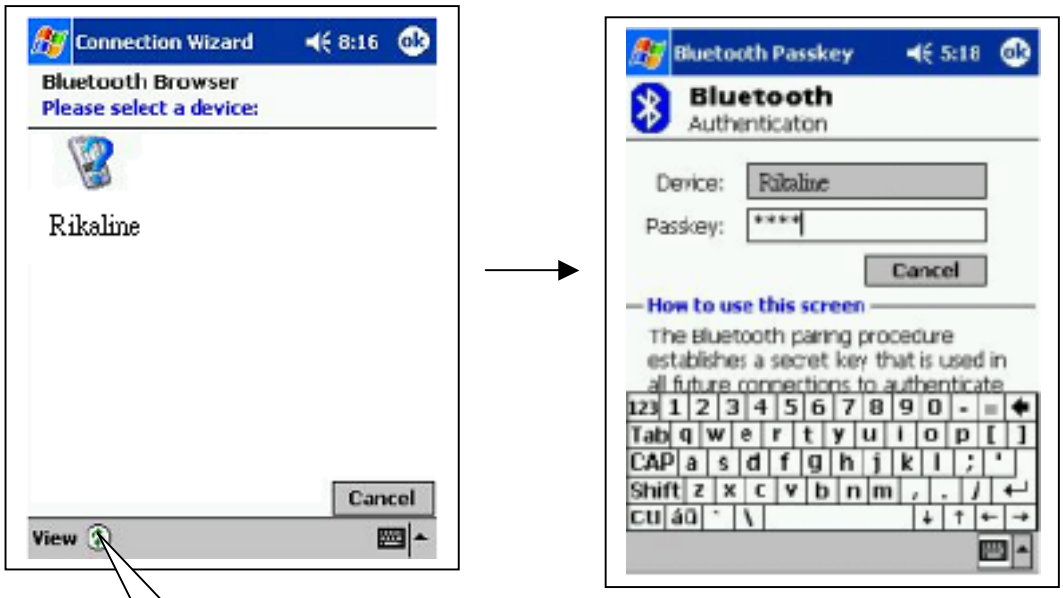

Fig. 1 Browse Service

Click this refresh button to find the device if the device is not in the device window.

Found the Bluetooth device and enter passkey
Tap “Rikaline”
Passkey: 0000

Double click the device with which you want to establish SPP connection to browse its service as Fig. 2.

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Connect to SPP Slave
Select SPP slave
Press " Next"
Press "Finish"

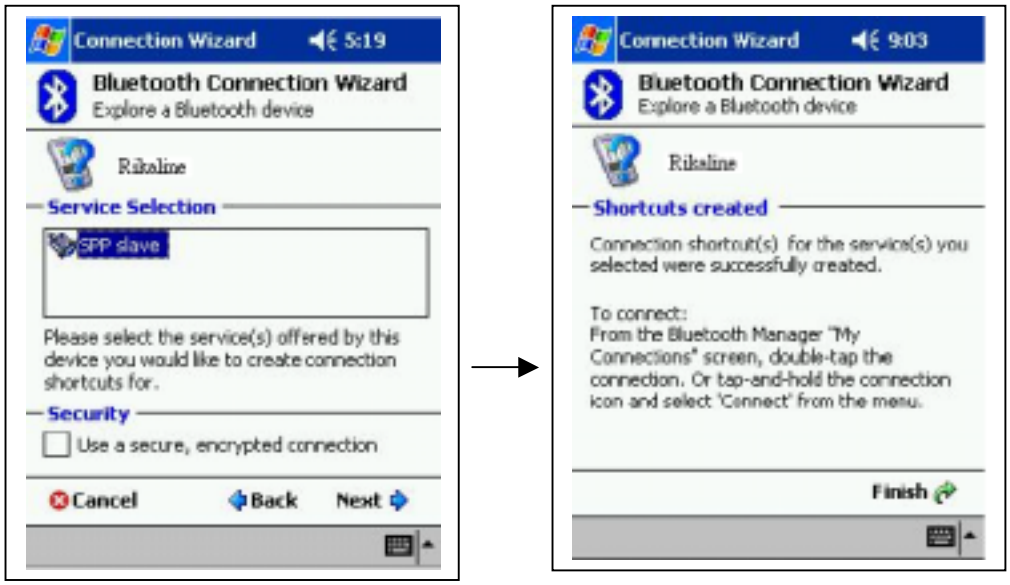

Fig. 2 Browse Service

Finish Bluetooth Manager Setup
Tap and Hold "Rikaline : SPP slave"
Press "Connect"
Finish Bluetooth setup

After you click the SPP service, it will show at left of followings:

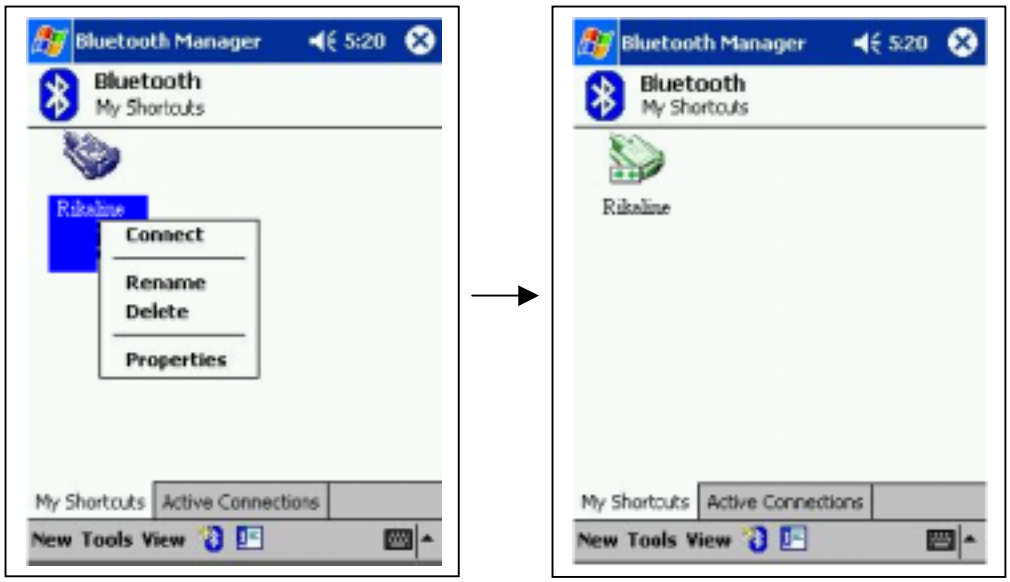

Fig. 3 Connect to SPP

Fig. 4

After connect successfully, it will show as Fig. 4

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Appendix B Earth Datums & Output Setting

B.1 Earth Datums

The GPS-6030 is built in earth datum with WGS84.

B.2 Setting

B.2.1 Manufacturing Default

Datum: WGS84.
Baud Rate: 38400.
Output: GGA, GSA, GSV, RMC, VTG.

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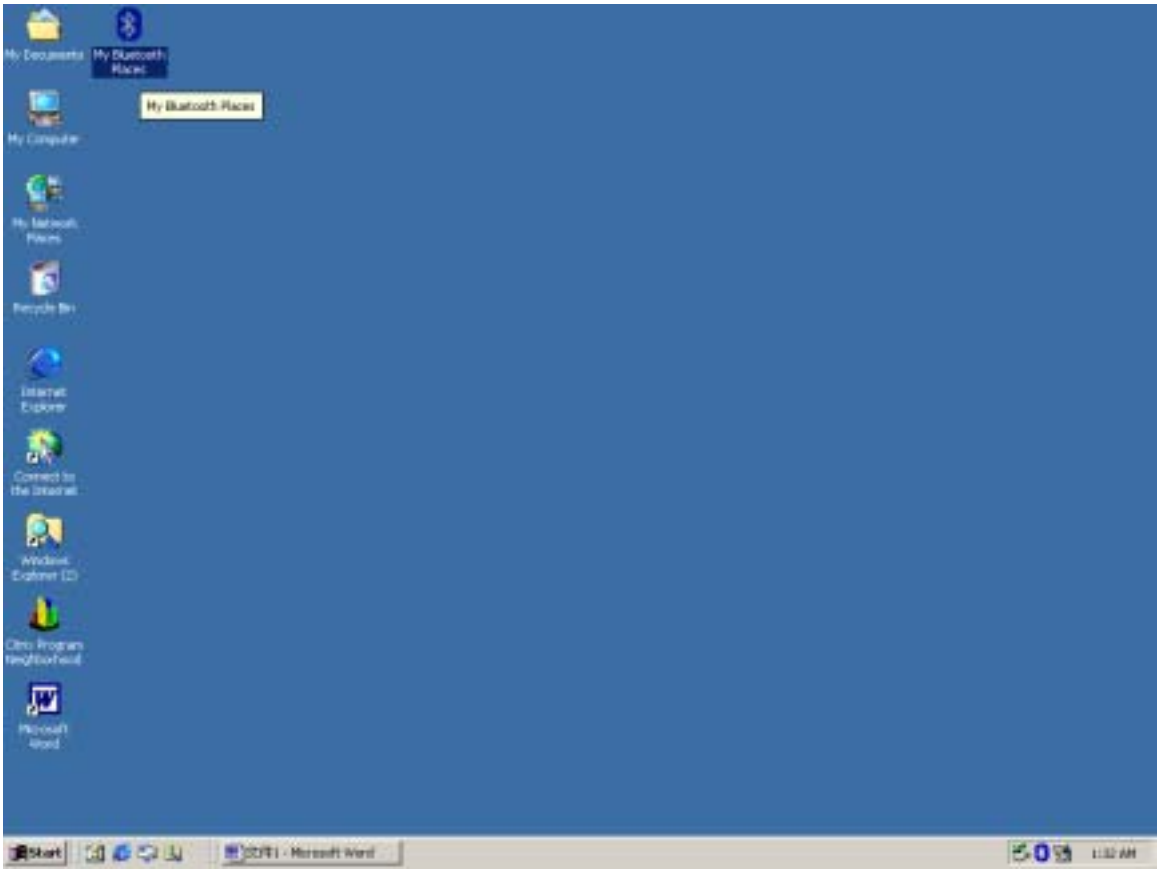
Appendix C Test Reference for Only

PC Bluetooth Setup with Widcomm BTW

<Note>This software does belong to copyright reserved of Widcomm company and you have to get the authorized software to use it. The follow method is only for reference.

The Bluetooth Serial Port service allows two Bluetooth devices to establish a wireless connection through virtual communications ports and then use that connection as if it were a hardwired serial cable between the devices.

To establish a Bluetooth serial port connection:
Connections are initiated from the client:
<1> On the client, in the Folders pane of My Bluetooth Places, select Entire Bluetooth Neighborhood.



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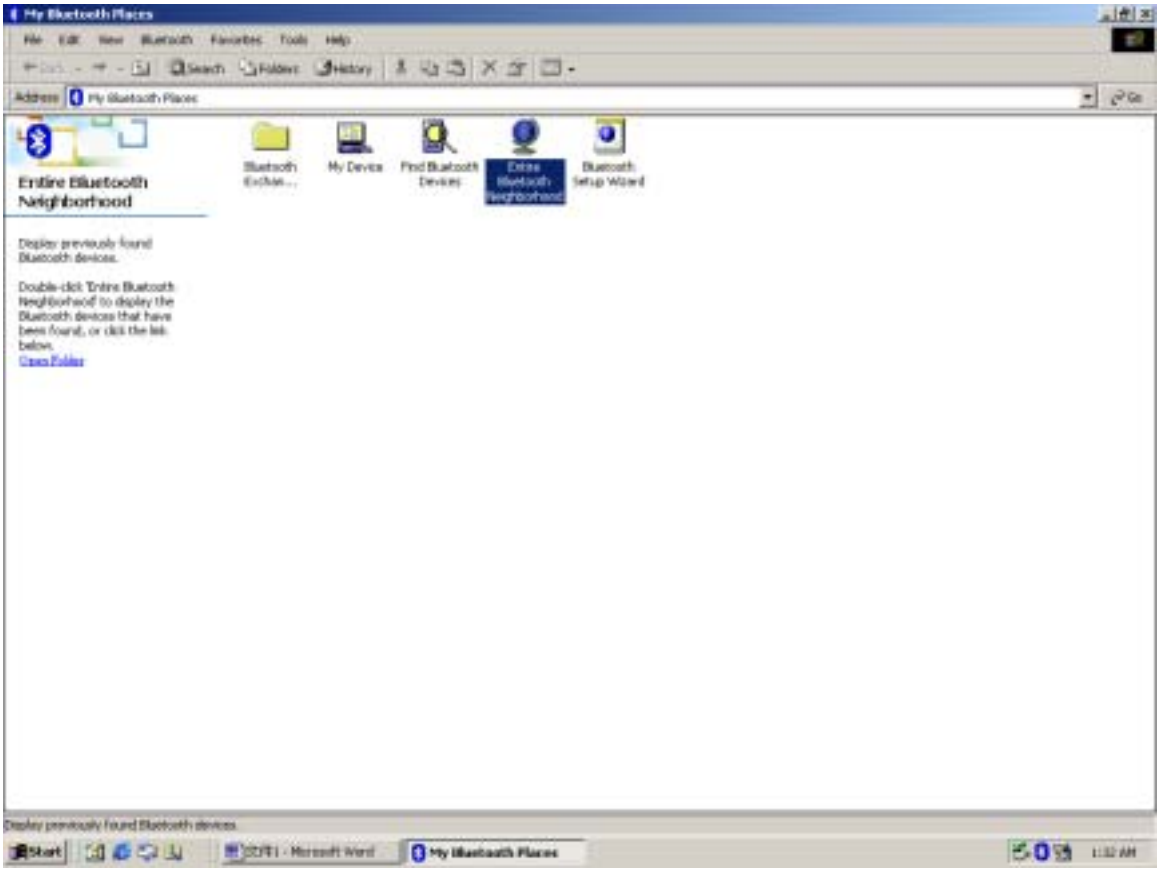
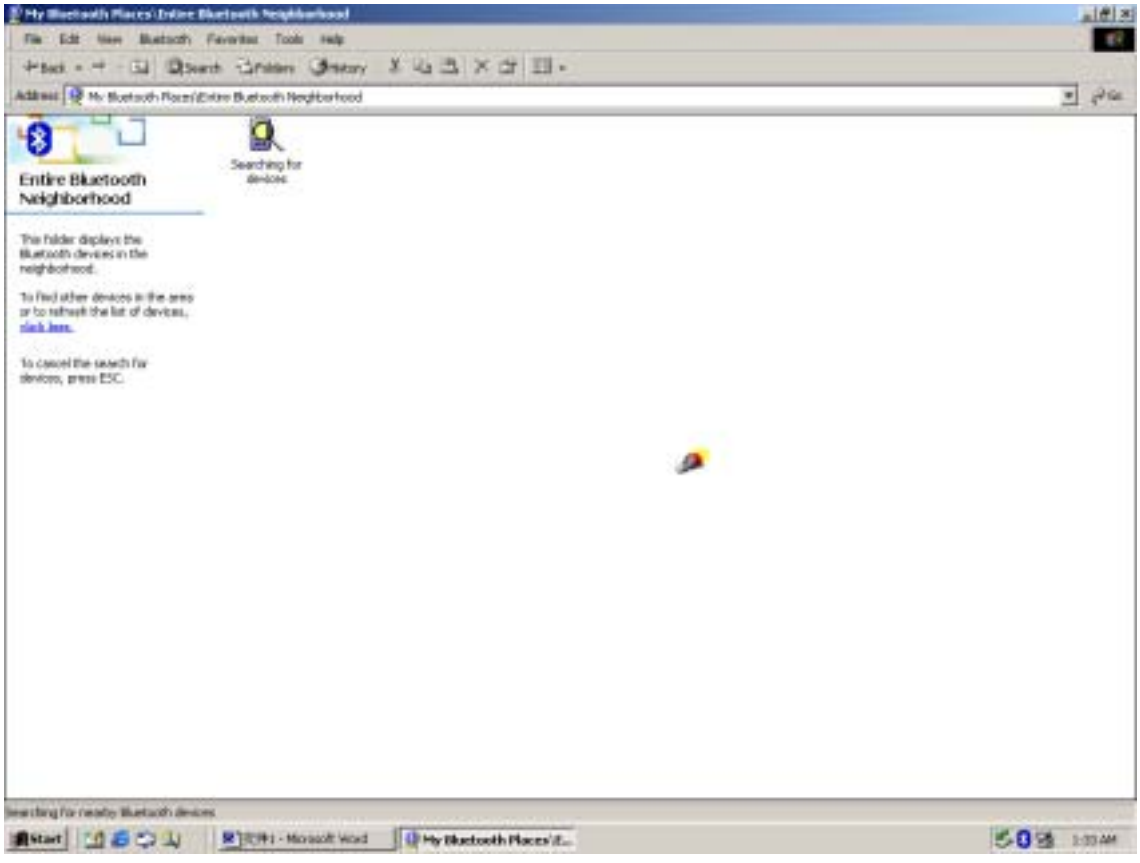


<2> In the right pane of Entire Bluetooth Neighborhood, right-click anywhere except on a device name and select Refresh from the pop-up menu.



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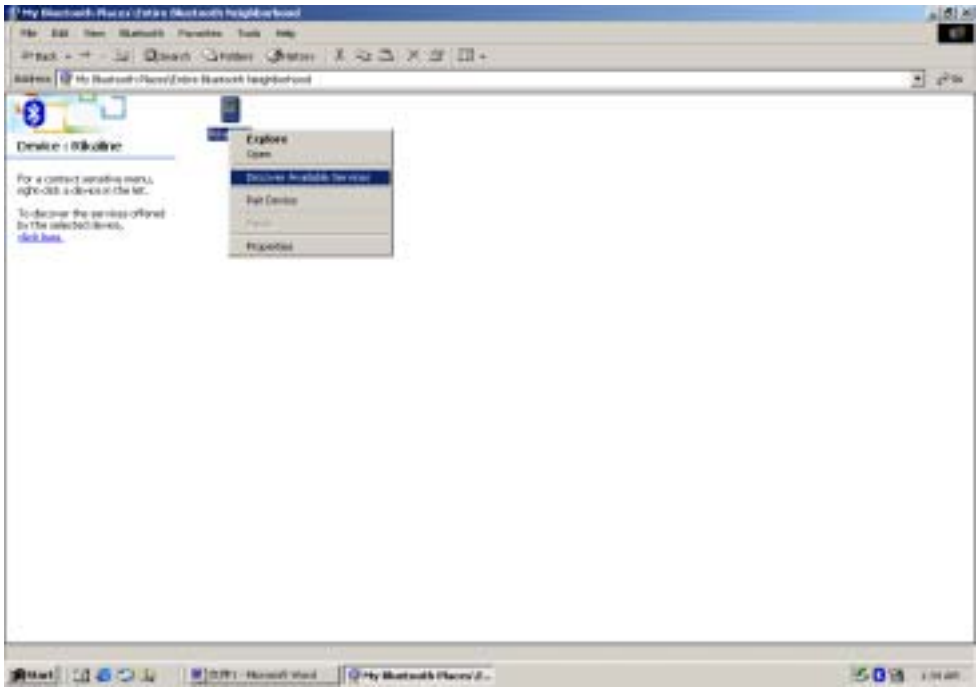
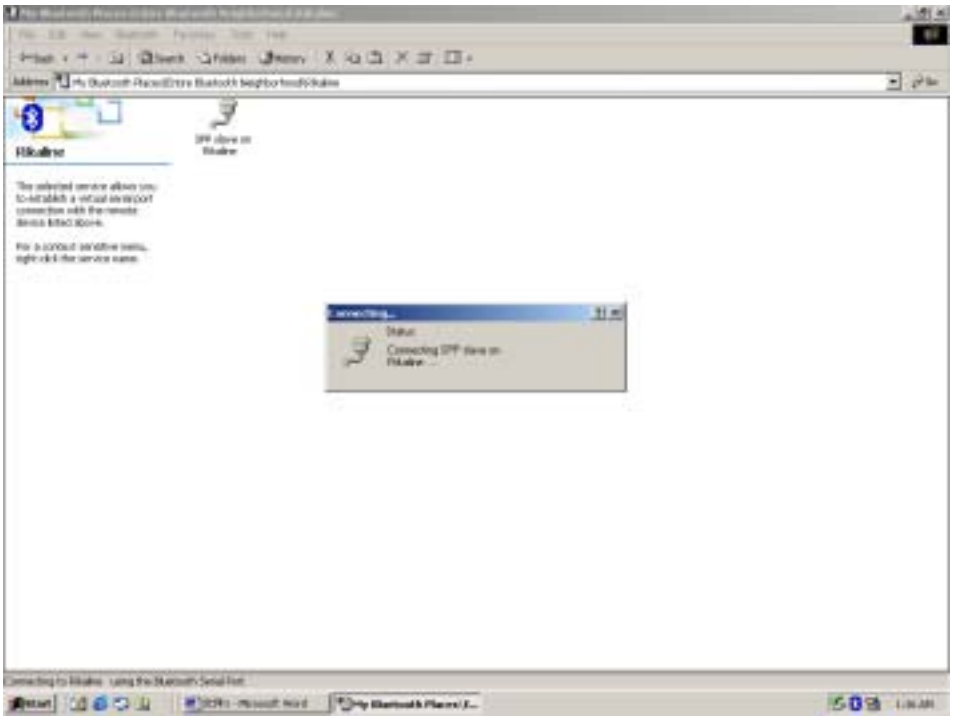
<3> In the Folders pane of My Bluetooth Places, right-click the server you want to establish a connection with and select Discover Available Services from the popup menu to update the available services list. The available services will be displayed in the right pane of My Bluetooth Places.



<4> In the right pane of My Bluetooth Places, double-click Bluetooth Serial Port. A dialog box appears that contains the communications port number assigned to this connection by the client. **The application that will use this connection must be configured to send data to this port.**



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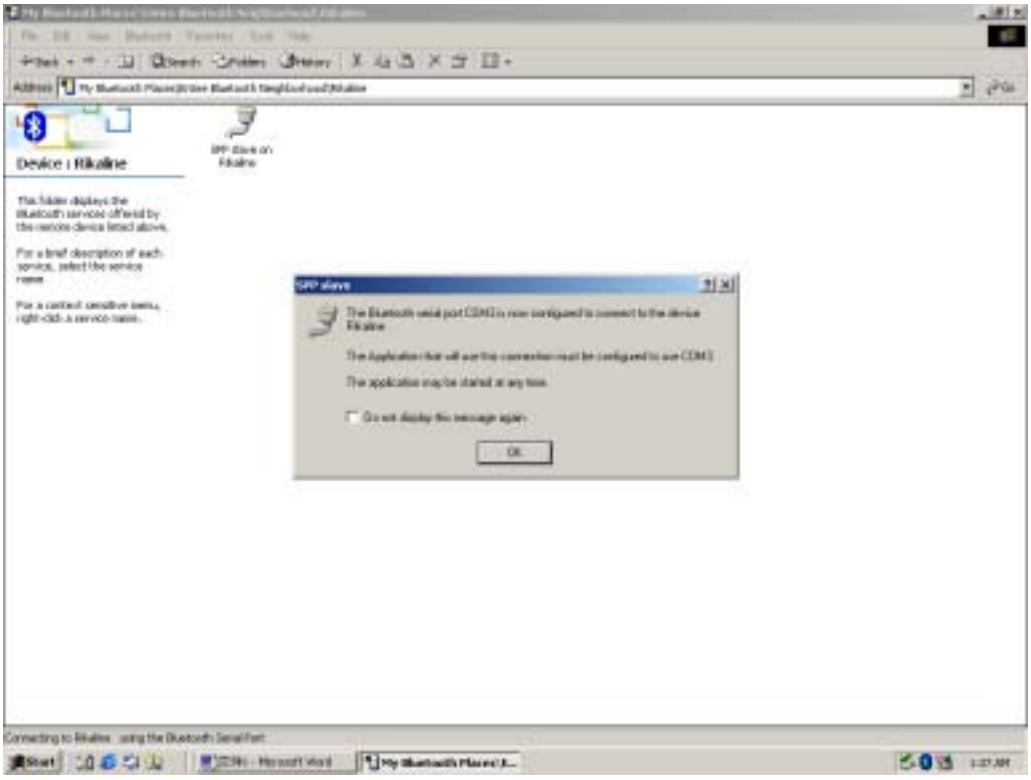
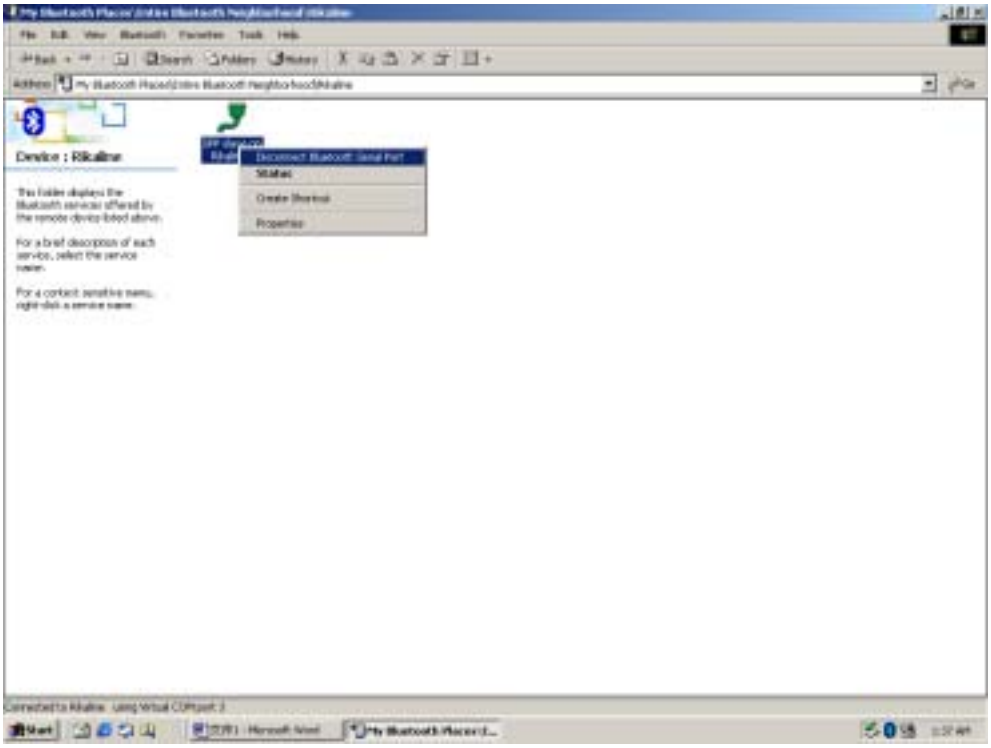


To close a Bluetooth serial port connection
Connections are normally closed from the client:

- On the client, in the Folders pane of My Bluetooth Places, select (highlight) the device that is providing the Bluetooth Serial Port service.
- In the right pane of My Bluetooth Places, right-click Bluetooth Serial Port and then select Disconnect Bluetooth Serial Port from the pop-up menu.



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Appendix D Trouble Shooting

D.1 Trouble Shooting

Problems	Reasons	Methods
No position output but timer is counting	Weak or no GPS signal can be received at the place of 6030	Which locate as a open space to your 6030 and then run Application Software Cold start function.
No position output but timer is counting	At outdoor space but GPS signal is blocked by building or car roof.	Go outdoor and run Application software Cold start function to try again.
Execute fail	Bluetooth function unstable	Re-Start PDA or PC and re-install software
Can not turn on the COM port	Install 6030 incompletely or operate the device is being used with same COM port	Install 6030 completely or stop other device that is being used.
Can not find out 6030	Poor connection	Re-Start PDA or PC and re-install software.
No Signal	No action for few minutes may cause Pocket PC entry power save mode. It will close the COM port at the same time.	Close the application and execute it again to reopen the COM port.
No Signal	Weak or no GPS signal when using 6030 indoor	Go outdoor to improve the poor GPS signal.

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Appendix E Ordering Information

E.1 Product Options

E.1.1 Standard Package

GPS-6030 (Bluetooth GPS Receiver) + Battery + Cigarette Adapter + power supply + adapters for the power supply + CD + Warranty Card + Quick Installation.

E.2 Accessories

E.2.1 Power Adapter

A-6016-40 Cigarette Adapter
A-6001-LT: Recharging Adapter, Universal, 120V, 230V, 240V-AU
A-5001: adapters for the power supply

E.2.2 Battery

A-9002: Battery, Li-ion, 900mAh

E.2.3 PDA Holder

1	A-2001	PDA Holder, Suction Cup, 150mm, Short Arm
2	A-2001-L	PDA Holder, Suction Cup, 150-320mm Adjustable
3	A-2002	PDA Holder, Suction Cup, 150mm, Short Arm, Magnetic Pad
4	A-2002-L	PDA Holder, Suction Cup, 320mm, Long Arm, Magnetic Pad
5	A-2005	PDA Holder, Suction Cup, 150mm, Short Arm, 4-Claw
6	A-2005-L	PDA Holder, Suction Cup, 320mm Long Arm, 4-Claw
7	A-2006	PDA Holder, Suction Cup, 150mm Short Arm, 3-Claw
8	A-2006-L	PDA Holder, Suction Cup, 150mm Long Arm, 3-Claw
9	A-2007	PDA Holder, Suction Cup, 150mm Short Straight Arm, 4-Claw
10	A-2008	PDA Holder, Suction Cup, 150mm Short Straight Arm, 3-Claw

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